ANNUAL ADMINISTRATIVE REPORT (FY 2004) AND WORK PLAN (FY 2005) FOR INVENTORIES AND VITAL SIGNS MONITORING

FY 2004-FY 2005

NORTHEAST TEMPERATE NETWORK

Includes: Acadia National Park, Appalachian National Scenic Trail, Boston Harbor Islands National Park Area, Marsh-Billings-Rockefeller National Historic Park, Minute Man National Historic Park, Morristown National Historic Park, Roosevelt-Vanderbilt National Historic Park, Saint Gaudens National Historic Site, Saratoga National Historic Park, Saugus Iron Works National Historic Site, Weir Farm National Historic Site

Northeast Temperate Network Approval Signatures

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Rolf Diamant, Superintendent, Marsh-Billings-Rockefeller NHP Date

Network Board of Directors

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Elizabeth Johnson, Regional Inventory and Monitoring Coordinator, Date

Northeast Region

I. Overview and Objectives

Ecological Context

The Northeast Temperate (NETN) contains 11 parks (Table 1.3), including a section of the Appalachian NST. These parks contain diverse cultural and natural resources within eight states (ME, NH, VT, MA, CT, NY, NJ, and PA) and span two ecological divisions (Laurentian / Acadian and Central Interior & Appalachian, Figure 1.4). Parks within the Network range geographically from Acadia NP in coastal Maine to Morristown NHP in central New Jersey.

NETN parks range in size from ≈ 9 acres at Saugus Iron Works to ≈ 85,000 acres covered by the Appalachian Trail (NPS lands from ME-MD), include the beginning and end of the Revolutionary War (Minute Man NHP and Saratoga NHP respectively), and a strategic military location for General George Washington (Morristown NHP). Two National Historic Parks commemorate the lives of artists (Saint-Gaudens NHS and Weir Farm NHS) and Roosevelt-Vanderbilt NHS celebrates the lives of the "Gilded Age". Marsh-Billings-Rockefeller NHP and Boston Harbor Islands NPA are both new to the NPS and unique in their establishment and mandates. Marsh-Billings-Rockefeller NHP is the only national park to focus on conservation history and the evolving nature of land stewardship. Boston Harbor Islands, established in 1996, are a culturally and naturally diverse set of 34 drowned drumlins in the Massachusetts Bay managed by a 13-member partnership. Saugus Iron Works NHS marks the site of the first integrated iron works in North America, which gave rise to the industrial revolution and is known as the forerunner of America's industrial giants. Acadia is the only National Park in the NETN and hosts a diverse array of cultural, natural, and geologic resources. The Appalachian Trail, crosses some of the most diverse ecological communities in the Northeast, is managed by a unique partnership with the NPS and the Appalachian Trail Conference, and provides an exciting opportunity for ecological monitoring across 2,100 miles of habitat representative of the entire east coast of the US. Eight of the eleven NETN parks are National Historic Parks or Sites, and thus have a primary mandate to maintain historical features, landscapes or practices. This special mandate has a substantial impact on ecological resources within these parks, as they are often managed to maintain early successional habitats, or incorporate agriculture or forestry within the parks to satisfy this mandate.

Program Overview

The NETN biological inventories have been conducted including avian, reptile and amphibians, and mammals, as well as targeted invasive plant inventories. All of these projects will complete field work in FY2005 and will provide the necessary sampling to document 90% of vertebrate species in NETN parks. To conduct these inventories, cooperative agreements were established with the Wildlife Conservation Society, the USGS, the University of Rhode Island, and the Vermont Institute of Natural Science. As part of the inventory program, compilation and cataloging of existing data into the three national I&M databases, NPSpecies, NatureBib and the Dataset Catalog, continues, and newly acquired I&M data and information are starting to be used in park planning processes.

Significant progress continues with vegetation mapping in Network parks. ACAD is complete and several other parks, MORR, SARA, ROVA and WEFA have draft maps. All of the parks have digital orthophotos and mosaics (except ACAD and SAIR) for mapping. NatureServe will complete mapping and classification for three New England parks, MABI, MIMA and SAGA. BOHA and SAIR both have significant existing floristic and community data that will be used to develop vegetation mapping program products. NatureServe will put these products together in proper formats. The Network is also cooperating with NatureServe to determine the feasibility of vegetation mapping at APPA. North Carolina State University is handling the GIS component for the network parks and providing the necessary accuracy assessments for all vegetation mapping aerial photography.

The NETN Vital Signs Monitoring Program is working with cooperators from the State University of New York and USGS as the core science team to develop the network monitoring plan. The network submitted the Phase 2 report in September 2004 identifying 23 high priority vital signs that will form the foundation of the vital signs monitoring program. The network plans to continue working with the core science team to develop protocols with detailed standard operating procedures (SOP) that will be used to implement standardized monitoring across network parks to assess the ecological integrity of forest, wetlands, aquatic resources, and intertidal habitats. Additional components to the NETN vital signs program in development include a contaminants inventory, landscape dynamics, and developing an ecological integrity scorecard.

A. Objectives for Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Complete inventories to document 90% of vertebrates and vascular plants and conduct inventories targeted at taxonomic groups of special concern to Network parks.
3. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

B. Objectives for Vital Signs Monitoring

4. Summarize existing data and information.
5. Design and implement a Vital Signs monitoring plan for network parks.
6. Develop and implement a data management plan including development of a network webpage.

C. Objective for Water Quality Monitoring

7. Develop water quality monitoring in the network parks

II. Accomplishments and Scheduled Activities

A. Biological Inventories

Objective 1 – *Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.*

Task 1.1 – NPSpecies Database

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments**: (1) Vermont Institute of Natural Science (Faccio) bird survey data acquired and entered into NPSpecies for MABI and SAGA. Dataset reviewed, comments directed to researchers, and certification process initiated. (2) APPA Natural Diversity database acquired from Casey Reese and sent to WASO for conversion into NPSpecies format. Resulting NPSpecies file was reviewed and uploaded for on-line use. Desktop version retained and editorial changes initiated. (3) Acquired preliminary Boston Harbor Islands Lichen and Bryophyte data from Scott LaGreca, Harvard University, and developed a procedure to import his Excel spreadsheet data into NPSpecies. Following final review, data shall be integrated into existing Boston Harbor Islands NPSpecies database. (4) Network data manager attended NPSpecies certification workshop during April, 2004 in Las Vegas. (5) Provided feedback and support to Mojave Desert Network data manager on a conversion system to link NPSpecies with ANCS+. (6) Acquired data collected by cooperating plant ecologist, Ted Elliman, who identified vascular plants at BOHA and APPA. Developed a conversion process to convert the Elliman plant data into NPSpecies and will integrate these data into the respective NPSpecies datasets following final review and certification.
- **Scheduled FY 2005 Activities and Products:** (1) Continue to acquire and evaluate inventory data and add these data to NPSpecies; (2) certify vertebrate and vascular plant records in accordance with I&M protocols.

Task 1.2 – Integrate completed vegetation mapping data into NPSpecies

Parks involved: ACAD

- **FY2004Accomplishments*:*** (1) ACAD staff reviewed and uploaded a certified NPSpecies dataset, making ACAD one of the first National Parks to complete this task. (2) The PLOTS database, developed by USGS as part of the vegetation mapping project, was sent to WASO for conversion into NPSpecies format. (3) All records contained in the PLOTS database have been added to a desk-top version of the existing NPSpecies dataset.
- **FY 2005 Scheduled Activities and Products**: Review and certify newly added NPSpecies records and upload revised version of database to WASO.

Task 1.3 –NatureBIB Database

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) Reviewed Scott Tiffney's fall 2003 NatureBIB report, and contacted Scott regarding the status of editorial updates on behalf of Bruce Jacobson. (2) Contacted Scott Tiffney in response to inquiries from the public about NatureBIB at BOHA and appended several new BOHA NatureBIB references provided by the public. (3) Scott Tiffney began to assess the overall status of all NETN park NatureBib databases and will began detailed editing. Specifically, Tiffney is assessing each park NatureBib database for duplication, spelling, authority control, data integrity and comprehensiveness. (4) ProCite bibliography for APPA converted by WASO to NatureBIB format and made available online. (5) Scott Tiffney completed a draft Northeast Region NatureBib Data Management Plan and a draft Northeast Region NatureBib Data Entry Manual.
- **Scheduled FY 2005 Activities and Products:** Support Scott Tiffney as he continues to review, update, and edit NatureBIB databases as needed.

Task 1.4 Create Digital Photo Mosaics, Assess Positional Accuracy, Create Metadata, Format and Distribute Data

***Parks Involved*:** ROVA, SARA, WEFA, MABI, MIMA, SAGA, BOHA

- **FY 2004 Accomplishments**: (1) A cooperative agreement was established with North Carolina State University to assist in aerial photograph associated with vegetation mapping. (2) Created digital orthophoto mosaics for ROVA, SARA, WEFA, MABI, and SAGA. (3) Assessed positional accuracy of the SARA, MABI, and SAGA mosaics. (4) Created metadata for the SARA, MABI, and SAGA mosaics. (5) Distributed preliminary copies of completed mosaics, as requested.
- **FY 2005 Scheduled activities and products:** (1) Assess positional accuracy of the ROVA, WEFA, MIMA, and BOHA mosaics based on field data collected by park personnel. (2) Create metadata for the ROVA, WEFA, MIMA, and BOHA mosaics. (3) Complete the MIMA mosaic in October 2004. (4) Begin work on the BOHA mosaic as soon as we finish the MIMA mosaic and expect to complete it well before the March 2005 scheduled delivery date.

Task 1.5 Natural Resource Inventory Database and Spatial Data Review

***Parks Involved*:** NER network parks

- **FY 2004 Accomplishments:** NCState is working closely with the NER I&M parks to conduct tabular and spatial data reviews. This task involves working with I&M Program cooperators and contractors to assure that natural resource inventory data are georeferenced according to national standards and are spatially consistent with GIS data for the corresponding park(s). Specifically, for each inventory project that we review, we; (1) Verify that vector data contained in the shapefiles submitted for the project line up with existing park GIS data, (2) Review tabular

data for completeness and internal consistency and assist with soliciting any missing information, (3) Verify that complete, FGDC compliant metadata exists and create biological metadata for each dataset, (4) and construct Microsoft Word formatted data dictionaries for each dataset.

- **FY 2005 Scheduled activities and products:** Cooperators at NC State will review spatial and tabular data for accuracy for; (1) Bird Inventory (P.I.: Peter Paton) – BOHA, ROVA, MIMA, MORR, SAIR, SARA, WEFA, (2) Moth Inventory (P.I.: Mark Mello) – BOHA, (3) Bird Inventory (P.I.: Steve Facio) – MABI, SAGA, (4) Lichen and Moss Inventory (P.I.: Scott LaGreca) – BOHA. These reviews will be completed within the next three to four months. Additional inventory studies will be reviewed throughout FY 2005 as NER Network Data Managers provide data to NCState.

Objective 2 – *Complete inventories to document 90% of vertebrates and vascular plants and conduct inventories targeted at taxonomic groups of special concern to Network parks.*

Task 2.1 – Mammal inventories (Principal Investigator A. O'Connell, USGS)

Parks Involved: ACAD, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, WEFA

- **FY 2004 Accomplishments:** (1) The first round of mammal sampling at the parks was completed in May 2004 while the second round of sampling is expected to conclude in November 2004. (2) Vegetation parameters around the mammal sampling points have been collected for all sampling locations greater than 300 meters apart. GIS coverages of vegetation types around the sampling points were ground-truthed while collecting the vegetation data. (3) An access database has been created to store the vegetation measurements. To date, approximately one-half of the data has been entered into the database and work has begun on creating diversity indices, woody debris density, canopy density, overstory tree density, and habitat edge density. (4) The University of Rhode Island has received a completed study plan and a thesis proposal for the project, which includes the necessary permits from the Institutional Animal Care and Use Committee.
- **FY 2005 Scheduled activities and products**: (1) For FY 2005 the second round of mammal sampling will be completed and the remaining track samples, hair samples, and photographs will be identified to species. (2) The remaining vegetation data will be added to the database and appended to a database created to store mammal capture information. (3) Independent variables will continue to be assembled at the local and landscape scales. Data analyses will proceed once all of the variables are collected. (4) Coursework at the University of Rhode Island will be complete by December 2004 while data analysis, report preparation, and thesis submission will occur before August 2005.

Task 2.2 – Avian inventories (Principal Investigator P. Paton, URI)

***Parks Involved*:** ROVA, SAIR, WEFA, BOHA, MORR, MIMA, SARA

- **FY 2004 Accomplishments:** (1) All VCP data collected during the 2002 and 2003 field seasons were entered into a database and thoroughly checked for quality and accuracy. (2) Data summary was completed in fall 2003, and a draft final report describing the spatial distribution and abundance of birds in each park, in addition to copies of all data, was submitted in December, 2003. (3) A part time researcher was hired to compile available data to develop a conservation strategy for grassland birds at SARA. Field specific data from SARA were matched with current best management practices from the literature to devise specific recommendations to guide grassland management in the Park.
- **FY 2005 Scheduled Activities and Products:** The data collected by Peter Paton will be reviewed and certified by a research assistant at the University of Rhode Island in accordance with NPS guidelines for certification of biological data. This will provide the necessary review to certify all the bird data from this inventory.

Task 2.3 – Avian inventories (Principal Investigator S. Faccio, VINS)

Parks Involved: MABI, SAGA

- **FY 2004 Accomplishments:** Vermont Institute of Natural Science (Faccio) bird survey data acquired and entered into NPSpecies for MABI and SAGA. Dataset reviewed, comments directed to researchers, and certification process initiated.
- **FY 2005 Scheduled Activities and Products:** Complete certification process and upload the data to the online version of NPSpecies.

Task 2.4 – Marsh Bird inventories (Principal Investigator J. Longcore, USGS)

Parks Involved: ACAD

FY 2004 Accomplishments: Field work completed.

FY 2005 Scheduled Activities and Products: Submit final report and data**.**

Task 2.7 – Invasive plant inventories

***Parks Involved*:** BOHA, MABI, MIMA, SAIR

- **FY 2004 Accomplishments**: (1) Developed sampling grid overlays for all Boston Harbor Islands. (2) Worked with BOHA resource staff to devise a strategy to survey BOHA for invasive species. (3) Developed invasive plant inventory database intended to store field observation data for BOHA project. (4) Received reports and data for MIMA and SAIR invasive plant inventory project. (5) Sent MIMA and SAIR data to NCState to compile metadata records. (6) Completed field survey for invasive plants at MABI
- **FY 2005 Scheduled Activities and Products:** Data from BOHA invasive species project will be evaluated upon receipt.

Task 2.8 – Inventory of reptiles and amphibians (Principal Investigator J. Behler, WCS)

***Parks Involved*:** ACAD, MIMA, MORR, SAGA, SAIR, SARA, WEFA

- **FY 2004 Accomplishments:** A cooperative agreement was established in 2000 between The National Park Service (NPS) and The Wildlife Conservation Society (WCS) to conduct amphibian and reptile inventory research in several national parks in the Northeast region. In FY 2004, report drafts were prepared, compilation of amphibian and reptile data was completed and maps were generated for each park, detailing species occurrence and distribution. The final report, maps, and database for work conducted at ACAD were completed and submitted this year.
- **FY 2005 Scheduled Activities and Products:** Draft reports will be revised and final reports will be submitted for MORR, WEFA, SAGA, SAIR, SARA, MIMA, where inventory surveys have already been conducted.

Task 2.9 – Inventory of inter-tidal fishes (Principal Investigator L. Kling, UMaine)

***Parks involved*:** ACAD

- **FY 2004 Accomplishments:** Fish were inventoried during two field seasons, 2001 and 2002 at Acadia. The objective was to sample as many diverse habitats as possible in the inter-tidal and estuarine zones to maximize the resultant species lists. The fieldwork component of the project has been completed. We are presently entering data into Microsoft Access and Excel for the data inventory and analysis required. We have completed most of the information required in the tide pool section, but have substantial work remaining for the estuarine component.
- **FY 2005 Scheduled Activities and Products**: We plan to have the project report completed in November 2004. Mr. Jordaan will also be presenting some of the work at a science symposium in Acadia National Park in early November.

***Objective 3** – Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.*

Task 3.1 – Vegetation Mapping (NY Natural Heritage)

Parks Involved: (SARA, ROVA*)*

- **FY 2004 Accomplishments**: (1) Field work has been completed for SARA and ROVA. (2) Vegetation cover data were collected from 69 observation points in 10 field days for SARA (5 days and 27 points for Schuylerville Section, 5 days and 42 points for Battlefield Section). (3) Natural communities surveyed of interest in the Schuylerville Section include a silver maple dominated floodplain forest remnant, and an Appalachian oak-hickory forest patch with several large canopy trees at Victory Woods (see attached photos). (4) Vegetation cover data were collected from 26 observation points in 5 field days for ROVA (3 days and 18 points for FDR, 1 day and 1 point for Vanderbilt, and 1 day and 7 points for ValKill). (5) The locations of 23 large trees at Vanderbilt were located using GPS with DJ Evans (NYNHP Ecologist) in an effort to document the old-growth status of the oak-tulip tree forest. The diameter at breast height (dbh) for these trees, which included scarlet, chestnut, & white oak, tulip-tree, and sugar maple ranged

from 62 to 146 cm (avg. 102 cm dbh). (6) Lastly, the full extent of the state significant red cedar rocky summit at the FDR Estate was fully documented. This community supports a good population of prickly pear cactus (*Opuntia humifusa*) which is uncommon, but not rare in NY.

- **FY 2005 Scheduled activities and products**: NY Natural Heritage will complete statistical vegetation analyses, finalizing vegetation maps, and conducting accuracy assessment sampling of SARA and ROVA by September, 2005. Greg Edinger (NYNHP Program Ecologist) will complete the digital community maps for Schuylerville and Battlefield sections of SARA during winter 2004-2005. Digital maps for ROVA will begin after 2003 digital imagery is provided by NPS (not received as of October 4, 2004). During this same period Greg will complete the statistical analysis of the plot data and produce draft classifications for SARA ROVA, including descriptions of new NVC associations.

Task 3.2 – Vegetation Mapping (CT Natural Heritage)

Parks Involved: (WEFA*)*

- **FY 2004 Accomplishments**: Data collection and mapping was completed at Weir Farm. Excluding the managed fields, seven vegetation types were classified and mapped: three upland forest types, two forested wetlands, and two wetland shrub thickets on the site reflecting the moisture conditions of the soil. As throughout much of lower Fairfield County, Connecticut, white tail deer have significantly altered the structure and diversity of the vegetation of Weir Farm making the classification and recognition of plant associations difficult. The appropriate association with the Connecticut and the NVC types is currently underway. Classification of the managed fields has been a challenge, with our current thoughts to classify these areas as complexes and describing them as such.
- **FY 2005 Scheduled activities and products**: CT Natural Heritage (Kenneth Metzler) will submit the final report and map for Weir Farm before the end of FY2005.

Task 3.3 -- Development of keys to NVC associations in the Lower New England (LNE) and North Atlantic Coast (NAC) ecoregions (NatureServe)

Parks Involved: SAGA, MIMA, SAIR, ROVA, SARA, MORR, WEFA, BOHA

- **FY2004 Accomplishments:** NS received extension to provide final products pending review by NPS.
- **FY 2005 Scheduled Activities and Products:** All final keys and classifications to be submitted in October 2004.

Task 3.4 -- Conduct a vegetation mapping feasibility study (NatureServe L. Sneddon)

Parks Involved: APPA, BOHA, SAIR

- **FY2004 Accomplishments:** (1) BOHA: NS (Lesley Sneddon) made field visit with Ted Elliman in October 03. Wrote and delivered draft and final feasibility studies. Developed and submitted proposal for completing vegetation

classification, map, and metadata. Proposal was funded and agreement was signed. Requested and received draft budget for field work by Ted Elliman. (2) SAIR: NS (Lesley Sneddon) wrote and delivered draft and final feasibility studies. Developed and submitted proposal for completing vegetation classification, map, and metadata. Proposal was funded and agreement was signed. Field visit made in July to collect plot data – 5 plots completed. (3) APPA NS (Sue Gawler) spoke with Greg Shriver and his contractor John Gunn about how to use existing information to develop a draft map; requested and received GIS layers.

- **FY 2005 Scheduled Activities and Products:** (1) BOHA: NS will prepare subcontract for Ted Elliman to complete field work in field season 2005. (2) NS will prepare subcontract for mapper (Sewall) to edit draft map prepared by Elliman. (3) NS will hold conference call with all heritage programs with APPA park lands and with NPS staff to assess state of existing information and develop a plan for mapping. (4) NS will submit proposal to NPS for developing classification, map and metadata. Results from this work will advance the vegetation mapping efforts for APPA and BOHA.

Task 3.5 -- Complete vegetation classification, mapping, and metadata and assemble all products into set of deliverables that meet the VMP standards (NatureServe L. Sneddon)

Parks Involved: MIMA, MABI, SAGA, MORR

- **FY2004 Accomplishments:** (1) MABI: NS (Sue Gawler) researched existing materials and obtained 2002 digital map that will serve as an excellent base. Developed contract with Vermont Natural Heritage Program (VTNHP) to conduct field work. Scoping meeting held 13 May 2004 with VTNHP staff and Heritage Program contractors including park tour. Subcontract sent out for signature. 1-day reconnaissance visit to site with park staff and ecology subcontractor (Engstrom). Reviewed sampling methodology and draft list of types with on-the-ground checking. Plot sampling underway. (2) SAGA: NS (Sue Gawler) scoped out New Hampshire Natural Heritage Bureau (NHNHB) as contractor for both fieldwork and mapping; solicited and received proposal; developed contract with NHNHB; scoping meeting held 13 May with NHP staff and Heritage Program contractors. Held reconnaissance for plot sampling with new NH Heritage ecologist (contractor) & park personnel. (3) MIMA: contacted potential contractors for vegetation sampling and mapping; developed two contracts: ecologist and mapper; Scoping meeting 5 May 2004 with NPS staff and mapping contractor (Sewall). Subcontracts finalized. Refined list of potential vegetation types and sampling methodology developed for reconnaissance meeting 1 July 2004. Plot sampling complete (39 plots). MORR: NS (Lesley Sneddon) subcontracted field work to Bob Zaremba, and all field work was completed after 2004 field season. Draft vegetation classification was developed by NS (Lesley Sneddon and Bob Zaremba). Much progress was made in photointerpretation by contractor John Thompson. NS (Lesley Sneddon) received proposal for digitizing from Great Swamp Watershed Association (GSWA). Contractors identified for accuracy assessment field work.

- **FY2005 Scheduled activities and products**: MABI: NS will complete or oversee the completion of all vegetation classification, mapping and metadata production. SAGA: NS will complete or oversee the completion of all vegetation classification, mapping and metadata production. MIMA: NS will complete or oversee the completion of all vegetation classification, mapping and metadata production. MORR: NS to finalize vegetation classification and map units. Contract for digitizing and production of metadata will be written to GSWA, and products are expected this year. Contracts for accuracy assessment will be written, and AA field work will be completed field season 2005.

Task 3.6 -- Vegetation mapping at Acadia (USGS)

Parks Involved: ACAD

- **FY2004 Accomplishments:** A wrap-up meeting was conducted at ACAD in October 2003 to review the final products, including: a detailed final report; spatial database coverages of the vegetation map and associated data, digital files and hard copy data sheets of fieldwork; representative photos of vegetation communities; aerial photographs of the project area, their corresponding interpreted overlays and flight line index; metadata; and a CD-ROM containing all associated project components.
- **FY2005 Scheduled activities and products:** Project Completed

Task 3.7 -- Land-cover classification and change assessment (Principal Investigator Y. Q. Wang, URI).

Parks Involved: ACAD, APPA, MABI, MIMA, MORR, ROVA, SAGA, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) Preliminary land-cover data from circa 2002 are available for all Park study sites, and 80% of the APPA sites. (2) All land-cover data were frozen, compiled, and issued electronically to all stakeholders in September 2004 with accompanying letters describing the status of their respective data. (3) Fieldwork was completed in May and June 2004 with examinations of MIMA, MORR, ROVA, SARA, WEFA, and 8 of 10 of the remaining APPA sites. We met with a total of seventeen NPS staff, and Appalachian Trail Conference staff & volunteers while in the field in 2004. The final Virtual Field Reference Database (VFRDB) consists of approximately 2,800 georeferenced digital photographs recorded while in the field and the added attribute information. (4) GIS data has been downloaded, clipped, and reprojected from multiple sources for all eighteen study sites. (5) The Landsat satellite image library was exhaustively researched, final images selected, and an order for said images placed with USGS, filling the remaining gaps we have in our image database.
- **FY 2005 Scheduled Activities and Products:** (1) Process remaining Landsat images to be delivered by USGS and prepare them for analysis. (2) Complete image classifications for all eighteen study sites. (3) Refine image classifications with ancillary GIS data as appropriate, producing final land-cover data. (4) Complete accuracy assessment of land-cover data, then issue data to NPS and

ATC stakeholders for their review and feedback. (5) Create automated method for production of land-cover change statistics. (6) Package statistics, final land-cover data, VFRDB, source Landsat data, ancillary GIS data for distribution on CD or DVD. (7) Write summary reports to accompany these data which will, at minimum, describe methodology, land-cover change at all study sites, land-cover change relationships to existing conservation lands, and recommendations for further monitoring. (8) Generate publications for a refereed journal and conference proceedings. (9) Present the project at professional conferences.

B. Vital Signs Monitoring

Objective 4 *– Summarize existing data and information.*

Task 4.1 - Review Resource Management Plans and park documents

- **FY2004 Accomplishments**: (1) The NETN staff completed the reviews of all relevant park planning documents including GPRA goals and included these summaries in the Phase 2 report. (2) The network also continued to populate dataset catalog with existing park reports and spatial and tabular data. (3) The network digitized the 14 APPA Natural Heritage Inventories and other non-digital park documents to make them more accessible and posted those without sensitive information on the network website. (4) The network also supervised a 1 year position related to developing a biological inventory study plan and monitoring framework for APPA. The post-doc in this position reviewed and summarized the 14 APPA Natural Heritage Inventories and drafted a biological inventory study plan. (5) As part of the Phase 2 planning process, the network reviewed park monitoring programs and cross-walked park indicators to selected vital signs.
- **Scheduled FY 2005 Activities and Products**: The network staff will continue to catalogue and make I&M and park related documents readily available. We are working with our UMASS webpage developers to make relevant I&M reports and data (with metadata) available on the NETN webpage.

Task 4.2 - Summarize Regional Monitoring Programs

- **FY2004 Accomplishments**: The network data manager developed a database to catalog ongoing monitoring programs adjacent or applicable to parks in the NETN and reported these results in the Phase 2 report. The objectives, timeframe, indicators, and contacts were identified for more than 150 adjacent to park monitoring programs and is already being considered an important resource to parks.
- **Scheduled FY 2005 Activities and Products**: The network staff will continue to populate the ongoing monitoring program database and work to make the database available on the network webpage as a test to determine the ability of the network webpage to import and disseminate data.

Task 4.3 – Identify existing information and priority inventory needs for APPA.

Parks Involved: APPA

- **FY 2004 Accomplishments:** (1) Secured a post-doc position through the State University of New York to draft a biological inventory study plan, review the Natural Heritage Inventories, and all APPA network vital sign reports. (2) Organized a workshop/scoping meeting to discuss the interaction between APPA and the five networks through which the trail passes. The meeting, which occurred in October 2004, included representatives from all five networks, WASO, and key APPA staff.
- **Scheduled FY 2005 Activities and Products:** Following the APPA workshop, the networks agreed to identify existing information and data corresponding to the ten most significant vital signs applicable to the trail. Each item identified by the group shall be investigated and summarized in a brief document by 31 January 2005. NETN plans to acquire a complete set of the summaries and compile them into a consolidated "state of the trail" document.

***Objective 5** – Design and implement a Vital Signs monitoring plan for network parks.*

Task 5.1 – Develop conceptual ecological models and identify indicators

- **FY 2004 Accomplishments:** Two sets of conceptual models (both narratives and diagrams) were developed to aid in selecting park vital signs. The first set of models was developed to describe the general ecological systems of the NETN parks (aquatic, intertidal, terrestrial, and wetland) and the second set of models were park based. Both sets of models describe the current state of understanding for the processes in each system, identifies the stressors on those systems, and show what potential indicators would be. The park based models provide the appropriate context by showing the proportion of each ecological system in that park and identifies any park specific stressors.
- **FY 2005 Scheduled Activities and Products:** Revise the conceptual models as necessary based on the review of the Phase 2 report and use the conceptual models to further refine vital signs development.

Task 5.2 – Plan for and host the Vital Signs Selection Workshop

- **FY 2004 Accomplishments:** The network core science team drafted all the necessary materials for the Vital Signs Selection Workshop held at the Schoodic Education and Research Center, Acadia NP (May 2004). More than 40 subject matter experts and park staff reviewed a pre-ranked list of potential vital signs for network parks. Park based posters providing background information, significant natural resources, and major resource issues where displayed throughout the workshop. The network data manager designed a database to capture the discussion and decisions of the four topical workgroups (aquatic, intertidal, terrestrial, and wetland) to facilitate summarizing the proceedings.

- **FY 2005 Scheduled Activities and Products:** The network core science team will seek peer review for the Phase 2 report and revise the report as necessary.

Task 5.3 – Draft and submit Phase 2 report (Chapters 1-3 of monitoring plan)

- **FY2004 Accomplishments**: The network coordinator, data manager, and university partners drafted and submitted the Phase 2 report. The report is a revision of Chapters 1 and 2 from Phase 1, including background information to the I&M program, summaries of parks, resource management priorities, threats to park natural resources, and conceptual models, and includes the first draft of Chapter 3 outlining the vital signs selection process. The network selected 23 vital signs as a result of the Phase 2 planning process.
- **Scheduled FY 2005 Activities and Products**: Seek reviews and continue to revise the Phase 2 report to incorporate comments and feedback from the national office, park staff, and outside reviewers.

Task 5.4 – Draft the NETN monitoring plan

- **FY2004 Accomplishments**: The network coordinator, data manager, and university partners drafted and submitted the Phase 2 report (see above tasks).
- **Scheduled FY 2005 Activities and Products**: Given approval of the NETN Phase 2 report by the national I&M program, the network will work with cooperators to draft proposals to write protocols for monitoring the 23 selected vital signs for network parks. The network will develop protocols for water quality vital signs with USGS partners, forest and terrestrial ecological system vital signs with the State University of New York, and, pending funding, solicit proposals to develop intertidal monitoring protocols. We will draft and submit examples of Protocol Development Summaries for terrestrial and aquatic vital signs. The network will collaborate with the Northeast Coastal Barrier Network to integrate protocols for coastal marine ecosystems at ACAD and BOHA. By 15 December 2005 we will have draft protocols in place, as well as clear methods for assessing status and trends of indicators and communicating our findings through an ecological integrity scorecard.

Objective 6 *– Develop and implement a data management program.*

Task 6.1– Acquire all readily available park related GIS datasets.

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) Submitted a request to WASO for seamless DRG, Land-use/Land-cover, and digital elevation maps for each park and several segments along the Appalachian Trail corresponding to the locations around which the URI Land Cover study is focusing. (2) Acquired 2003 aerial photo for SAIR. (3) Acquired breeding bird route and stop locations for APPA and all bird data associated with those routes. (4) Acquired data layer of conservation lands in the US to assist URI Land Cover project. (5) Maintained all previously acquired spatial data for the network parks.

- **Scheduled FY 2005 Activities and Products:** Network staff has begun to acquire plant distribution data for the eastern region of the United States. These data will be used to generate GIS layers showing general plant distribution and the distribution of invasive/exotic species in the vicinity of network parks to provide information related to an early detection of invasive species monitoring program.

Task 6.2 – Communication, data distribution, and network webpage.

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) Worked with cooperators at UMASS to design a network webpage, including a database driven "dynamic" component that announces network news (*http://www1.nature.nps.gov/im/units/netn/*); (2) developed initial NETN "administration" website to allow NETN administrators to add news items and delete old items without having to write HTML code; (3) maintained and supported production website; (4) developed initial prototype for a web based task management system to help NETN staff coordinate projects underway by various cooperators; (5) produced a network brochure to describe the network and the I&M program to a broad audience.
- **Scheduled FY 2005 Activities and Products**: The UMASS webpage developers will (1) write a users guide for the task system – a document for NETN to give to new cooperators on how to use the system; (2) develop and implement an online survey form and will solicit comments from park resource managers on the utility of the production web-site design and ways it can be improved; (3) design and develop new updated "reports" pages as needed; (4) develop a replacement "data" page and consider how it relates or works with the new NPS data server (*http://science.nature.nps.gov/nrgis/*); (5) other web-development or maintenance tasks as instructed by NETN office.

Task 6.3 – FGDC Metadata

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

FY 2004 Accomplishments: (1) NETN data manager completed NPS course on metadata generation; (2) worked with NCState staff to develop metadata for several network based projects.

Scheduled FY 2005 Activities and Products: (1) Continue to work with NCState cooperators; (2) establish requirements that FGDC compliant metadata be compiled for all future projects funded by the NETN.

Task 6.4 – Information management including QA/QC

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) NETN staff reviewed datasets and deliverables originating from existing projects, evaluating them for accuracy and completeness

with reference to any standards established at project commencement; (2) worked with NCState staff on the evaluation of existing project data, including data obtained from Dr. Peter Paton and the Vermont Institute of Natural Science; (3) implemented an automated computer system back-up routine to ensure the stability and security of all network maintained data; (4) implemented a version control system that tracks the development of electronic documents and files; (5) installed a project management system to track the status of all park programs; (6) reviewed all herp inventory spatial and tabular data for accuracy.

- **Scheduled FY 2005 Activities and Products:** Based on prior experience, controls shall be established to ensure that all network derived data is of a known and acceptable quality. The Network QA/QC requirements shall address, where applicable: protocols and standards; standard operating procedures; data verification, validation, and editing; data documentation & metadata standards; and, data summaries and analyses.

Task 6.5 – Data management planning and database development

Parks Involved: ACAD, APPA, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, and WEFA.

- **FY 2004 Accomplishments:** (1) NETN staff participated in several meetings and conference calls with staff from other I&M networks to define requirements and standards for a network data management plan; (2) submitted three data management plan chapter segments for general I&M program use and dissemination; (3) developed a network data management plan outline.
- **Scheduled FY 2005 Activities and Products:** the network data manager will oversee the following tasks; (1) write a comprehensive network focused data management plan; (2) develop databases to support the implementation of the vital sign monitoring program; (3) acquire and organize data from cooperators and other sources, and distribute that information to network parks and other interested parties.

C. Water Quality Monitoring

Objective 7 – *Develop water quality monitoring in the Network parks.*

Task 7.1 – Select high priority freshwater quality vital signs

***Parks Involved*:** ACAD, BOHA, MABI, MIMA, MORR, ROVA, SAGA, SAIR, SARA, WEFA

- **FY 2004 Accomplishments:** (1) Drafted list of all potential freshwater vital signs that could potentially be important in NETN parks. (2) Facilitated freshwater aquatic workgroup of water quality professionals to prioritize draft list of water quality vital signs and justifications. (3) Wrote up proceedings of workshop. (4) Finalized list of water quality vital signs and justifications with guidance from technical steering committee.
- **FY 2005 Scheduled Activities and Products:** (1) Complete, review, approve,

and distribute phase II report; workshop proceedings and prioritized list of vital signs. (2) Initiate phase III, the design of prototype network-wide monitoring protocols.

Task 7.2 – Evaluate park monitoring programs for compatibility with the NETN vital signs program.

***Parks Involved*:** ACAD, MORR, SAGA, SAIR, ROVA

- **FY 2004 Accomplishments:** Produced a matrix with parks with current monitoring programs along the top horizontal and the high priority vital signs down the vertical and indicate any intersections. Intersections were examined to determine whether the existing method/protocol is compatible with a mandatory measure of the NETN's high priority vital signs. Locate and review all existing park monitoring protocols.
- **FY 2005 Scheduled Activities and Products:** Continue to complete and fill in matrix for all parks in the network as we begin design of vital signs monitoring programs in specific parks.

III. Staffing

Inventory and Monitoring Staff

Beth Johnson, Northeast Regional I&M Coordinator
Greg Shriver, Northeast Temperate Network I&M Coordinator
Fred Dieffenbach, Northeast Temperate Network Data Manager
Theresa Moore, Northeast Temperate Network Science Communications Specialist

Board of Directors

Rolf Diamant, Superintendent Marsh-Billings-Rockefeller National Historical Park
Sheridan Steele, Superintendent Acadia National Park
Pamela Underhill, Superintendent Appalachian National Scenic Trail
George Price, Superintendent Boston Harbor Islands National Park Area
Nancy Nelson, Superintendent Minute Man National Historical Park
John Hnedak, acting, Superintendent Morristown National Historical Park
Sarah Olson, Superintendent Roosevelt-Vanderbilt National Historic Site
Steven Kesselman, Superintendent Saugus Iron Works National Historic Site
Frank Dean, Superintendent Saratoga National Historical Park
Randy Turner, Superintendent Weir Farm National Historic Site
BJ Dunn, Acting Superintendent Saint Gaudens National Historic Site
Mary Foley, Chief Scientist Boston Support Office
Elizabeth Johnson, Regional I&M Coordinator University of Rhode Island
Greg Shriver, Northeast Temperate Network Coordinator

Technical Steering Committee Members

Brian Underwood, USGS, SUNY Syracuse, Wildlife Biologist
Sam Droege, USGS Patuxent, Monitoring Program Developer
David Manski, Acadia National Park, Chief Natural Resource Manager
David Hayes, Roosevelt-Vanderbilt NHS, Natural Resource Specialist
Christopher Eagar, USFS, Forest Ecosystem Ecologist

Wayne Millington, NPS, IPM
Tonnie Maniero, NPS, Air Quality
Mary Foley, NPS, Regional Chief Scientist
Charles Roman, NPS, North Atlantic Coast CESU Coordinator and Wetland Ecologist
Brooke Childrey, Acadia National Park, Curator
Beth Johnson, NPS, Regional I&M Coordinator
Fred Dieffenbach, NPS, NETN Data Manager
Greg Shriver, NPS, NETN Coordinator

IV. Reports, Publications and Presentations

Agius, B. 2004. Revolutionary Changes to an American Landscape: Invasive Plant Species at the Minute Man National Historical Park. Final Report submitted to the National Park Service. 38 pp.

Agius, B. 2004. Forging Changes in an American Landscape: Invasive Plant Species at the Saugus Iron Works National Historic Site. Final Report submitted to the National Park Service. 16 pp.

Bell, R. Intertidal habitat inventory: Boston Harbor Island National Park Area. Boston Harbor Islands Science Symposium, Boston Museum of Science 7 October 2003.

Behler, J. L., D. K. Brotherton, and R. Cook. 2004. Acadia National Park Amphibian and Reptile Inventory, March-September 2001. National Park Service.

Castellano, C. M., J. L. Behler, R. P. Cook, D. K. Brotherton. 2003. National Parks in the Northeast: Preserving America's Herpetological Heritage. Herpetological Review 34(3), 192-193.

Dieffenbach, F. W. 2004. Northeast Temperate Network Project management: a potential alternative. I&M Annual Data Management Meeting, Las Vegas, Nevada. (Presentation)

Faber-Lagendoen, D., G. Tierney, W. G. Shriver, P. J. Lombard, J. P. Gibbs, and F. W. Dieffenbach. 2004. Monitoring ecological resources within U.S. National Parks: Developing "Vital Signs" of ecological integrity for the Northeast Temperate Network. Monitoring Science and Technology Symposium, Denver, Colorado, 20-24 September 2004. (Presentation)

Faber-Langendoen, D., G. Tierney, W. G. Shriver, P. J. Lombard, J. P. Gibbs, F. W. Dieffenbach. 2004. Monitoring ecological resources within U.S. National Parks: Developing "Vital Signs" of ecological integrity for the Northeast Temperate Network. *In*: Aguirre-Bravo, Celedonio, et. al. Eds. 2004. Monitoring Science and Technology Symposium: Unifying Knowledge for Sustainability in the Western Hemisphere; 2004 September 20-24; Denver, CO. Proceedings RMRS-P-000. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Facio, S. D. 2003. A biological inventory of breeding birds at the Marsh-Billings-Rockefeller NHP and adjacent lands, Woodstock, Vermont. Final report submitted to the National Park Service, September 2003. 22 pp.

Facio, S. D. 2003. A biological inventory of breeding birds at the Saint-Gaudens NHS, Cornish, New Hampshire. Final report submitted to the National Park Service, September 2003. 23 pp.

Gilbert, A. T. and A. F. O'Connell, Jr. 2003. Retrieval, Compilation, and Organization of Vertebrate and Vascular Plant Voucher Specimens Originating from National Parks. Harmon, D., ed. Proceedings of the 13th Conference on *Protecting Our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites*. Hancock, MI: The George Wright Society.

Greene, C.W., J. Weber, S. Rooney, and K. B. Anderson. 2003. Invasive Plant Species Distribution and Abundance in Acadia National Park. (In review).

Lombard, P. J. 2003. Freshwater issues for National Parks of the Northeast. Phase 1: a coping report for the Northeast Temperate Network. US Geological Survey Final Report, Augusta, Maine. 101 pp.

Lombard, P. J. 2004. Freshwater issues for National Parks of the Northeast. Phase 2: Selection of water quality monitoring variables for Northeast Temperate Network Parks. US Geological Survey Final Report, Augusta, Maine. 44 pp.

Lubinski, S., K. Hop, S. Gawler. 2003. USGS-NPS Vegetation Mapping Program: Acadia National Park, Maine. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, July 2003. 52 pp + Appendixes A-I.

Mather, M. E. A. J. Norris, and M. P. Carey. 2002. Freshwater Fish Inventory Northeast National Parks, 1999-2001. Final report submitted to the National Park Service. 336 pp.

Mittelhauser, G. 2003. The distribution and ecology of Purple Sandpipers wintering in the Acadia National Park region, Maine: spring 2003 data update. Unpublished report to Acadia National Park, Maine. 51 pp.

Mittelhauser, G.H. 2002. Local survival and movements of Harlequin Ducks (*Histrionicus histrionicus*) wintering at Isle au Haut, Maine, 1997-2002. Unpublished report to Acadia National Park, U.S. Fish and Wildlife Service, and Maine Department of Inland Fisheries and Wildlife. 43 pp.

Mittelhauser, G.H. (In Press). Apparent survival and local movements of Harlequin Ducks wintering at Isle au Haut, Maine, 1997-2002. Pages 00-00 *in* Robertson, G.J. and P.W. Thomas (Eds.), Harlequin Ducks in the Northwest Atlantic. Canadian Wildlife Service Occasional Paper, No. 000. Ottawa.

Mittelhauser, G.H., J.B. Drury, and E. Morrison. (In Press). Behavior and diving of Harlequin Ducks wintering at Isle au Haut, Maine. Pages 00-00 *in* Robertson, G.J. and P.W. Thomas (Eds.), Harlequin Ducks in the Northwest Atlantic. Canadian Wildlife Service Occasional Paper, No. 000. Ottawa.

O'Connell, A. F. and A. T. Gilbert. 2002. Annual Conference of the Natural Science Collections Alliance, Washington, DC. Voucher Specimens of vertebrates and vascular plants originating in northeastern national parks: retrieval of the information and what they can tell us about biodiversity. (Poster Presentation).

O'Connell, A. F. and A. T. Gilbert. 2003. Using natural history collections to assess biodiversity. The GWS/CR2003 Joint Conference. San Diego, CA. (Oral Presentation)

O'Connell, A. F., and A. T. Gilbert. 2002. 12th Annual Conference of the Society of Environmental Journalists. Baltimore, MD. Voucher Specimens of vertebrates and vascular plants originating in northeastern national parks: retrieval of the information and what they can tell us about biodiversity. (Poster Presentation).

O'Connell, A. F., and A. T. Gilbert. 2003. Retrieval, Compilation, and Exploratory Analyses of Voucher Specimens for Vertebrates and Vascular Plants in 14 Northeastern National Parks. Technical Report submitted to the National Park Service Inventory and Monitoring Program.

O'Connell, A.F., Jr, A. T. Gilbert, and J. S. Hatfield. 2004. The Influence of Natural History Collections and National Parks on Establishing a Database of Biodiversity. Conservation Biology 18:1254-1262.

Paton, P. W. C. Avian Surveys in Boston Harbor Islands: Preliminary Results. Scientific poster presented at the Boston Harbor Islands 2002 Biodiversity Seminar, May 30, 2002.

Paton, P. W. C., R. J. Harris, C. L. Trocki. (In Press). Distribution and abundance of birds during the breeding season in Boston Harbor. Northeastern Naturalist.

Paton, P. W. C., R. J. Harris, C. L. Trocki. Distribution and abundance of birds during the breeding season in Boston Harbor. Boston Harbor Islands Science Symposium, Boston Museum of Science 7 October 2003.

Shriver, W. G. 2003. The National Park Service Inventory and Monitoring Program. Presentation to the Appalachian Environmental Monitoring Initiative, New York Academy of Sciences, New York.

Shriver, W. G. 2003. The NPS Inventory and Monitoring Program: developing long term ecological monitoring in the Northeast Temperate Network. Boston Harbor Islands Science Symposium, Boston Museum of Science, 7 October 2003.

Shriver, W. G. 2003. The NPS Inventory and Monitoring Program: developing long term ecological monitoring in the Northeast Temperate Network. Presentation to the Appalachian Trail Conference, Fairlee Vermont.

Shriver, W. G. 2004. The NPS Inventory and Monitoring Program: developing long term ecological monitoring in the Northeast Temperate Network. Presentation to the Vermont Institute of Natural Science, Woodstock, Vermont.

Shriver, W.G., D. Faber-Langendoen, G. Tierney, P. Lombard, F. Dieffenbach, J.P. Gibbs. 2004. Northeast Temperate Inventory and Monitoring Network Vital Signs Monitoring Plan: Phase II Report. September 30, 2004. National Park Service, Northeast Temperate Network, Woodstock, Vermont. 121 pp. plus 17 appendices.

Skidds, D. July 7-11, 2003 ESRI International User Conference, San Diego, CA, Using GIS for Quality Assurance / Quality Control (QA/QC) of a Herpetological Inventory of Northeastern National Parks.

Tierney, G. L., D. Faber-Langendoen, W. G. Shriver, P. J. Lombard & J. P. Gibbs. 2004. Protecting ecological resources in the National Parks: Developing indicators of ecological integrity. Ecological Society of America Annual Meeting, Portland OR, 1-6 August 2004.

Tierney, G. L., D. Faber-Langendoen, W. G. Shriver, P. J. Lombard & J. P. Gibbs. 2004. Selecting Vital Signs of ecological condition for long-term monitoring in the National Parks. Annual Hubbard Brook Cooperator's Meeting, Thornton NH, 9-10 July 2004.

Trocki, C. and P. Paton. 2003. Avian surveys in Northeast Temperate Network Parks. Final report submitted to the National Park Service. 230 pp.

V. Status of Park Vital Signs Monitoring

Northeast Temperate Network 2004	Air Quality	Water Quality	Water Quantity	Geologic Resources	Plants	Animals	Landscape Characteristics
Planning and Design							
# parks monitoring w/ NETN funding	11	11	11	11	11	11	11
# parks monitoring w/ other funding	2	7	7	0	10	4	0
Protocols Implemented							
# parks monitoring w/ NETN funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	2	7	7	0	10	4	0
Analysis/Synthesis Available							
# parks monitoring w/ NETN funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	2	7	7	0	10	4	0

VI. USGS Protocol Development and Monitoring-Related Research Needs

1. *Early detection of invasive plants and animals*. The I&M program identified early detection as protocol development priority for multiple networks. NETN also has a need for early detection monitoring protocols.

2. *Visitor Impacts*: All NETN parks identified visitor impacts as an important vital sign and a standard, cost effective protocol for monitoring this potential stressor would likely aid many networks.

3. *Data acquisition, synthesis, and summary*. Climate and air quality vital signs for NETN will be summarized and interpreted for parks using existing monitoring programs and datasets. It would be helpful to have an automated, web-based system that would retrieve the necessary data for each network park and provide the basic data summaries given user defined time frames.

4. *Phenologic changes along the Appalachian Trail*. As part of the "State of the Trail" report being edited by NETN, assistance is needed to acquire and analyze phenologic data that reviews species range shifts, changes in growing season, alpine recession, and other metrics of climate change associated with the Appalachian Trail.

5. *Rocky intertidal protocol development*. Acadia and Boston Harbor Islands have significant rocky intertidal resources that will be included for monitoring in the vital signs program. Assistance is needed to develop all the necessary components of an I&M protocol for the rocky intertidal systems at these 2 parks. This protocol could be adopted by the Gulf of Maine Council Habitat Monitoring Committee and be implemented throughout the Gulf of Maine.

VII. Budget Narrative and Budget Printouts

Budget Narrative: In FY 2004, the network received, $631,200 Vital Signs Monitoring funds, $60,000 water quality funds, $62,600 national program funds to support a 1-year position assisting with the Appalachian Trail, and $45,000 vegetation mapping funds to continue the network's inventory and monitoring program. Monitoring funds were allocated to salaries for the network coordinator, data manager, and a 6-month science communication specialist. The network maintained and established cooperative agreements to advance the development of ecological monitoring and complete inventories in network parks, hosted a vital signs selection workshop, and presented a "short list" of 23 vital signs in the NETN Phase 2 report. The network coordinated APPA biological inventory funds and initiated a project to inventory mammals on more than 400 AT miles in PA, NJ, NY, and CT. The network data manager designed and installed a cost effective and efficient back-up system for all network documents and data to ensure information integrity. Additional monitoring funds were spent on travel and administrative costs.

In FY 2004, the NETN received $60,000 from the Water Resources Division to continue the design of the water quality monitoring program. The funds were used in cooperation with USGS through an interagency agreement. The USGS cooperators worked closely with the network as a component of the core science team to select water quality and water quantity related vital signs presented in the NETN Phase 2 report.

Budget Summary

FY04 Admin Report Network: 14 Northeast Temperate

Category: 1_Income

Description	$ Amount	$$ Source	Where $ Went	Comments
APPA from Mid-Atlantic	$0.00	I&M - Biol. Inventory $$		$80,200 from MIDN
Monitoring Funds	$631,200.00	I&M - VS Monitoring $$		
1/4 Regional Coordinator 2144-NII account	$30,000.00	I&M - VS Monitoring $$		
Water Quality Funds	$60,000.00	WRD - WQ Monitoring		
APPA I&M POC -- John Gunn	$62,600.00	I&M - VS Monitoring $$		
Additional Veg Mapping	$45,000.00	Veg. Mapping Program		
Subtotal	*$828,800.00*			

Category: 2_Personnel

Description	$ Amount	$$ Source	Where $ Went	Comments
MIMA & SAIR Invasive Species Staff	$9,524.87	I&M - VS Monitoring $$	NPS	Brad Agius
Network Coordinator	$74,278.55	I&M - VS Monitoring $$	NPS	Salary & Benefits
Data Manager	$70,433.61	I&M - VS Monitoring $$	NPS	Salary & Benefits
Network Data Miner	$23,776.72	I&M - VS Monitoring $$	NPS	Stationed at MABI (6-mo)
Regional Coordinator	$25,500.00	I&M - VS Monitoring $$	NPS	1/4 RC 2144 NII Account
Subtotal	*$203,513.75*			

Category: 3_Coop. Agreements

Description	$ Amount	$$ Source	Where $ Went	Comments
Mammal Inventory	$107,500.00	I&M - VS Monitoring $$	USGS	F4520020040 - O'Connell
Veg Mapping	$44,100.00	Veg. Mapping Program	NPS	CA4560-B-0009 - MABI, SAGA, MIMA, BOHA
URI Land Use Change	$109,868.00	I&M - VS Monitoring $$	University-CESU	CA4520-99-007 Wang - Year-2 of Study

Avian Inventory Certification	$1,820.00	I&M - VS Monitoring $$	University-CESU	1443CA4520-99-007 - Peter Paton - URI
USGS Maine Water Resources	$60,000.00	WRD - WQ Monitoring	USGS	IA4520030014 - Phase-2 of Study
APPA POC	$62,595.00	I&M - VS Monitoring $$	University-CESU	R4506040621 - WASO funded
NC State Data Management	$7,000.00	I&M - VS Monitoring $$	University-CESU	CA4560-C-0027 - North Carolina State University Photo mosaics

Forest Monitoring Phase II		$104,427.00	I&M - VS Monitoring $$	University-CESU	R4525037069/001 - SUNY-ESF
APPA Planning		$0.00	I&M - Biol. Inventory $$	University-CESU	H4560040069 - East Stroudsburg University - Funding from 2108 NII to conduct vertebrate Inventories on the Appalachian Trail
UMASS IT Development		$24,332.00	I&M - VS Monitoring $$	University-CESU	R4506040615 - Web development and other IT support
Mammal Inv. - Neil Telancy URI		$41,031.00	I&M - VS Monitoring $$	University-CESU	CA4520-99-008 - Mammal/fragmentation analyses
	Subtotal	*$562,673.00*			

Category: 5_Operations/Equipme

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
Regional Coordinator - Equipment	$700.00	I&M - VS Monitoring $$	NPS	
MABI Operations	$20,000.00	I&M - VS Monitoring $$	NPS	Administrative Support
Equipment	$3,961.19	I&M - VS Monitoring $$	NPS	Books and computer equipment
Subtotal	*$24,661.19*			

Category: 6_Travel

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
Regional Coordinator - Travel	$3,200.00	I&M - VS Monitoring $$	NPS	Travel to Network Meetings and Workshops
Travel	$19,912.06	I&M - VS Monitoring $$	NPS	Reduced to approximately 45% of FY03 travel
Subtotal	*$23,112.06*			

Category: 7_Other

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
NERO 2% Assessment	$600.00	I&M - VS Monitoring $$	NPS	Assessment from Regional Coordinator funds
NERO 2% assessment	$1,252.00	I&M - VS Monitoring $$	NPS	Assessment from APPA resource inventory and monitoring plan

					development funds
NERO 2% assessment		$900.00	Veg. Mapping Program	NPS	Assessment from veg mapping funds
NERO 2% assessment		$12,088.00	I&M - VS Monitoring $$	NPS	Assessment from monitoring funds
	Subtotal	*$14,840.00*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-CESU	Other non-Federal
I&M - Biol. Inventory $$	$0				$0		
I&M - VS Monitoring $$	$723,800	$265,227	$107,500		$351,073		
Veg. Mapping Program	$45,000	$45,000					
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$828,800	$310,227	$167,500		$351,073		

Analysis of Expenses by Category

Funding Source	Total $$	Personnel	Coop Agree.	Contracts	Operations/Equip.	Travel	Other
I&M - Biol. Inventory $$	$0		$0				
I&M - VS Monitoring $$	$723,800	$203,514	$458,573		$24,661	$23,112	$13,940
Veg. Mapping Program	$45,000		$44,100				$900
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$828,800	$203,514	$562,673		$24,661	$23,112	$14,840

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$203,514	24.51%
3_Coop. Agreements	$562,673	67.78%
5_Operations/Equipment	$24,661	2.97%
6_Travel	$23,112	2.78%
7_Other	$14,840	1.79%
	$828,800	

Budget Summary

FY05 Work Plan Network: 14 Northeast Temperate

Category: 1_Income

Description	$ Amount	$$ Source	Where $ Went	Comments
1/4 Regional Coordinator 2144-NII account	$30,000.00	I&M - VS Monitoring $$		
Water Quality Funds	$60,000.00	WRD - WQ Monitoring		
Monitoring Funds	$632,000.00	I&M - VS Monitoring $$		
Appalachian Trail Inventory Funds	$80,100.00	I&M - Biol. Inventory $$		
Subtotal	*$802,100.00*			

Category: 2_Personnel

Description	$ Amount	$$ Source	Where $ Went	Comments
Network Coordinator	$85,000.00	I&M - VS Monitoring $$	NPS	Salary & Benefits
Data Manager	$75,000.00	I&M - VS Monitoring $$	NPS	Salary & Benefits
Science Communication Specialist	$60,000.00	I&M - VS Monitoring $$	NPS	Salary & Benefits
Regional Coordinator	$25,500.00	I&M - VS Monitoring $$	NPS	1/4 RC 2144 NII Account
Park Staff Support for Phase 3	$25,000.00	I&M - VS Monitoring $$	NPS	Subject to Furlough
Awards	$4,000.00	I&M - VS Monitoring $$	NPS	Potential Awards Budget
Subtotal	*$274,500.00*			

Category: 3_Coop. Agreements

Description	$ Amount	$$ Source	Where $ Went	Comments
Wetland Monitoring Sampling Frame	$5,000.00	I&M - VS Monitoring $$	USGS	USGS/Neckles
APPA Inventories	$80,100.00	I&M - Biol. Inventory $$	Other Federal	To be determined
Vermont Ins. Natural Science	$25,000.00	I&M - VS Monitoring $$	Other non-Federal	Avian Monitoring Protocol
USGS Maine Water Resources	$60,000.00	WRD - WQ Monitoring	USGS	IA4520030014 - Phase-3 of study
Mammal Inventory	$14,000.00	I&M - VS Monitoring $$	USGS	USGS/O'Connell
USGS Maine Water Resources	$61,440.00	I&M - VS Monitoring $$	USGS	IA4520030014 - Phase-3 of study

NatureServe		$32,314.00	I&M - VS Monitoring $$	Other non-Federal	CA4560-B-0009 SA#12
Herp/Mammal Inv. BOHA		$23,000.00	I&M - VS Monitoring $$	University-CESU	Paton URI
Annual Park Manager Workshops		$3,000.00	I&M - VS Monitoring $$	Other Federal	Wetland/invasive plant id training
WCS Herp Reports/Certification		$4,000.00	I&M - VS Monitoring $$	Other non-Federal	
UMass IT Development		$18,461.00	I&M - VS Monitoring $$	University-CESU	
NatureBIB Funding		$5,000.00	I&M - VS Monitoring $$	University-CESU	Penn State/Tiffney
NCState		$16,966.00	I&M - VS Monitoring $$	University-CESU	veg. mapping/data mgt.
State University of New York		$83,729.00	I&M - VS Monitoring $$	University-CESU	
	Subtotal	*$432,010.00*			

Category: 5_Operations/Equipme

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
Equipment	$30,000.00	I&M - VS Monitoring $$	NPS	
MABI Operations	$20,000.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$50,000.00*			

Category: 6_Travel

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
Travel	$30,000.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$30,000.00*			

Category: 7_Other

Description	*$ Amount*	*$$ Source*	*Where $ Went*	*Comments*
2% NERO Assesment	$15,442.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$15,442.00*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-CESU	Other non-Federal
I&M - Biol. Inventory $$	$80,100			$80,100			
I&M - VS Monitoring $$	$661,852	$369,942	$80,440	$3,000	$147,156		$61,314
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$801,952	$369,942	$140,440	$83,100	$147,156		$61,314

Analysis of Expenses by Category

Funding Source	Total $$	Personnel	Coop Agree.	Contracts	Operations/Equip.	Travel	Other
I&M - Biol. Inventory $$	$80,100		$80,100				
I&M - VS Monitoring $$	$661,852	$274,500	$291,910		$50,000	$30,000	$15,442
WRD - WQ Monitoring	$60,000		$60,000				
Totals	$801,952	$274,500	$432,010		$50,000	$30,000	$15,442

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$274,500	253.29
3_Coop. Agreements	$432,010	398.63
5_Operations/Equipme	$50,000	46.14%
6_Travel	$30,000	27.68%
7_Other	$15,442	14.25%
	$801,952	

Appendix 1: Summary of Major Accomplishments

Northeast Temperate Network - This network of ten parks and, for planning purposes, the Appalachian Trail, includes Acadia NP, Boston Harbor Islands, Marsh-Billings-Rockefeller NHP, Minute Man NHP, Morristown NHP, Roosevelt-Vanderbilt NHP, Saint Gaudens NHP, Saratoga NHP, Saugus Iron Works NHS, and Weir Farm NHS. As part of its Vital Signs Monitoring efforts, the network includes active participation from the NCBN and all five APPA networks in 3 regions, ongoing park monitoring programs, the Appalachian Trail Conference, scientists with the USGS, and a number of universities in the northeast.

A. Objectives for Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Complete inventories to document 90% of vertebrates and vascular plants and conduct inventories targeted at taxonomic groups of special concern to Network parks.
3. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

Summary of Major Network Accomplishments During FY 2004 - The network has acquired, maintained, and cataloged into DataSet catalog (over 1,000 records) the majority of important spatial and tabular data sets and maintains the most current versions of base cartographic files.

The network mammal inventory initiated field sampling to document 90% of mammal species in network parks. This project has already documented new species in most parks and found relatively high abundance of *Felis domesticus* in many suburban parks.

The APPA I&M point of contact identified priority vertebrate inventories for the AT. A cooperative agreement was established with East Stroudsburg University to conduct a mammal inventory, targeting rare species, along more than 400 miles of trail in PA, NJ, NY, and CT. This project also acquired more than 30,000 records of birds from Breeding Bird Survey Routes bisected by the AT that will be used to populate NPSpecies for APPA.

The avian inventory final reports were submitted, reviewed, and nearing conclusion of the QA/QC process with NCState. This inventory documented 178 avian species in network parks including 26 species that have shown negative population trends indicating that these historical parks may play an important role in the conservation of bird species.

The herp inventories completed field sampling in network parks and submitted the Acadia herp inventory report. This report documented 18 reptile and amphibian species and also documented the absence of two formerly common amphibian species at Acadia, northern leopard frog, and northern dusky salamander.

The Acadia vegetation mapping PLOTS data were entered into NPSpecies to continue to build the vascular plant list for Acadia.

Invasive plant inventories completed by the I&M program at MIMA and MABI were used during the FY2004 field season by the Exotic Plant Management Team.

Vegetation mapping efforts at ROVA and SARA provided necessary information for vital signs prioritization, the landscape dynamics study, and park based resource management.

The landscape dynamics study under a cooperative agreement with the University of Rhode Island is assessing land cover change adjacent to parks from 1973-present. The URI team has acquired and classified all necessary LandSat imagery and has met with all the parks to review the process and customize any analyses. This project will be completed in August 2005 and will provide a landscape context for park ecological systems.

B. Objectives for Vital Signs Monitoring

4. Summarize existing data and information.
5. Design and implement a Vital Signs monitoring plan for network parks.
6. Develop and implement a data management program.

Summary of Major Network Accomplishments During FY 2004 - The network staff and core science team planned and hosted the Vital Signs Selection Workshop in May 2004 where over 40 subject matter experts attended to review the proposed list of NETN vital signs. This workshop provided the peer review necessary to justify the 23 selected vital signs for NETN. The network coordinator summarized the proceedings of the workshop included in the Phase 2 report. The peer reviewed list of vital signs was then presented to the parks, the technical steering committee and the board of directors for approval prior to submitting the Phase 2 report to the national I&M office. The network submitted the Phase 2 report on time incorporating comments made by the technical steering committee and park staff.

Prior to presenting the prioritized list of vital signs to the board and technical steering committee, the network met with both groups early in FY2004 to determine a process for vital signs selection and approve the FY0304 AARWP.

The network worked closely with the Appalachian Trail staff and the 5 AT networks to coordinate I&M activities related to the AT creating a 5 network and 3 region I&M working group. This forum will not only provide the necessary coordination to implement vital signs on the AT, but will also increase communication and collaboration on among the 5 networks in the 3 eastern regions. The network received support from the national I&M program for a 1-year position to assist with planning for biological inventories and vital signs monitoring on the AT. After discussion with the APPA staff and a review of the existing Natural Heritage Inventories we decided to prioritize biological inventories on vertebrates on AT lands outside of other federal entities. A cooperative agreement was established with East Stroudsburg University to design and implement a mammal inventory in PA, NJ, NY, and CT (over 400 miles of AT) starting

in Spring of 2005. This inventory will focus on at-risk or rare species in each state but use methods to detect as many mammal species as possible.

The network asked for and was granted board approval to advertise and hire a quantitative ecologist as a term position to support all aspects of the inventory and monitoring program. This position will be advertised early in FY2005.

A cooperative agreement was continued with the State University of New York College of Environmental Science and Forestry. This agreement focused on developing conceptual models for priority ecological systems within parks, listing potential indicators of ecological integrity for those systems, and integrating the natural heritage program ecological integrity ranking system into the long-term monitoring program. Cooperators from SUNY-ESF form an integral component of the NETN core science team and played a key role in selecting NETN vital signs.

During FY04, the network data manager participated in several meetings and conference calls with staff from other I&M networks. Most of the other participants represented year-1 networks who were working on the data management plan that will accompany their network's phase 3 monitoring plan. The fundamental objective for the meetings was to define programmatic requirements and standards for a network data management plan, and to develop a cooperative structure amongst all networks that will foster a collaborative approach to writing each network's respective plan. In support of this effort, the Northeast Temperate Network submitted three data management plan chapter segments that other networks can evaluate and possibly integrate into their own program. In addition to offering support to other networks, the Northeast Temperate Network has developed a network data management plan outline that currently emphasizes those parts of the plan that the network has already implemented. For example, the NETN outline contains detail on the project management system employed by the network, the computer back-up routine the network developed, and the version control application adopted by the network.

C. Objective for Water Quality Monitoring

7. Develop water quality monitoring in the Network parks

Summary of Major Network Accomplishments During FY 2004 The network continued an interagency agreement with USGS to assist in the development of water quality monitoring for network parks. The agreement follows the Phase reporting established by the I&M program. Phase 2 of this project was completed 15 September 2004 and provided the prioritization process, justification, and selection of water quality vital signs for network parks all presented in the NETN Phase 2 report. This agreement has produced 2 final reports related to water quality issues in NETN parks, both of which are incorporated into the NETN Phase 2 report.

Public Interest Highlights

Over 40 scientists with expertise in terrestrial, wetlands, marine, and freshwater ecosystems met with the Core Science team to help select the top vital signs for the NETN. The workshop process helped reduce a list of over 100 potential vital signs to 27. The final selected set of vital signs are available in the Phase II report, Table 3.6.

The network designed and published a Northeast Temperate Network informational brochure for distribution at each network park. This brochure provides background to the I&M program, the NETN parks, and contact information for the network and have been well distributed to park resource managers and interpretive staff to aid in communicating the mission of the I&M program to the public.

The network, in partnership with the UMASS cooperators, developed and launched the NETN webpage where important information is posted regarding the network progress (http://www1.nature.nps.gov/im/units/netn/index.cfm).

The vegetation mapping project at SARA led to the first significant floodplain forest occurrence documented by NY Natural Heritage on the Hudson River north of Albany. This stretch of the river has had very little natural community survey work done by NY Natural Heritage, and given the historical intensive land use of this area (e.g., agriculture and industrial development) we were pleasantly surprised to find a moderately large floodplain forest with relatively few invasive, non-native plants that are typical of this community in other examples throughout the state. Hopefully, this will spur further investigation for more patches of floodplain forest along this stretch of river.

A preliminary review of the data suggests that the forest at ROVA may be an old-growth remnant patch of oak-tulip tree forest. There are currently 11 other oak-tulip tree forest occurrences documented by NY Natural Heritage in the state. At 53 acres, the oak-tulip tree forest at Vanderbilt would be the smallest one we have in the database (avg. 720 acres), but given its potential old-growth condition it would still be considered significant from a statewide perspective. The average diameter of nearly two dozen trees found in this forest was over 1 meter!